



# Multipurpose Projects

Module M2: Cost Allocation



## Student Learning Objectives

The students will be able to:

- Without reference materials, correctly define and explain the difference between cost allocation and cost apportionment.
- Given a worksheet in class, correctly perform an example of the Separable Cost – Remaining Benefit Cost Allocation Method without physical injury.



## Definitions

- **Cost Allocation** is the process of equitably distributing project costs among project purposes.
- **Cost Apportionment** is the process of dividing the costs of a project between Federal and non-Federal interests.



## A Lunchtime Allocation Exercise

- Cafeteria
- Salad \$2/lb.
- Entrée \$5/lb.
- Employer lunch subsidy
  - 70% of salad
  - 30% of entree



## Questions

- If you are not very hungry and buy .5 pounds of salad. How much would lunch cost?
- If you are hungry and buy 1 pound of entrees. How much would lunch cost?
- You are very hungry and buy .5 pounds of salad and 1 pound of entrees. How much does lunch cost?



## Questions

- This meal costs \$6 - what is your share of this cost?



## Questions

- This meal costs \$6 - what is your share of this cost?
  - Salad:  $\$1.00 * 30\% = \$0.30$
  - Entrée:  $\$5.00 * 70\% = \$3.50$
  - Total =  $\$3.80$



## Questions

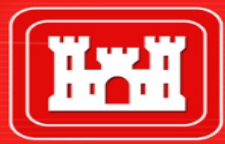
- This meal costs \$6 - your share of this cost is \$3.80.
- Who shares the cost with you and how much do they pay?





## Questions

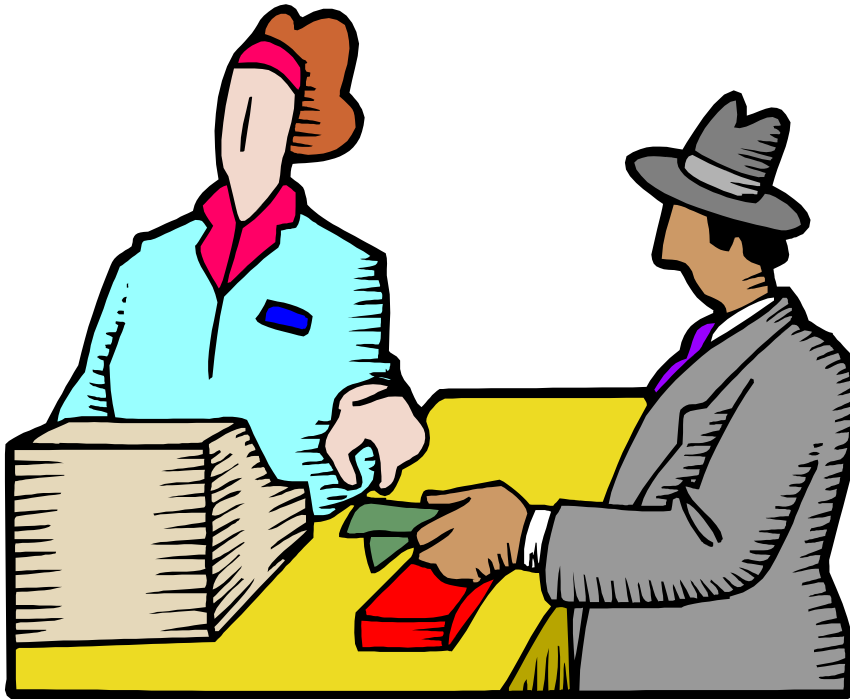
- This meal costs \$6 - your share of this cost is \$3.80.
- Who shares the cost with you and how much do they pay?
- Your employer pays \$2.20 of your lunch costs.



## Lunch Costs Require

- A meal (a plan)
- Separation of the meal into different purpose foods (project purposes)
- The cost of each purpose food (cost allocation)
- The subsidy on each type of food (cost sharing percentages)
- Some math to figure your cost and your employer's cost (cost apportionment)

## And Some Plate With That





## And Some Plate With That

- You are very hungry and buy .5 pound of salad, 1 pound of entrees, the plate weighs .5 pound.
- Plate jointly holds salad and entrées.
- What will be the charge for the plate?



## More Definitions: Cost Allocation

- **Separable costs** - costs incurred specifically to add a purpose to a project
- **Joint costs** - the difference between the total project costs and the sum of all separable costs



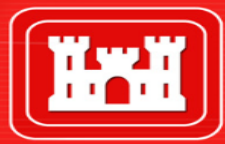
## Plate Charge

- You agree the plate is a joint cost - part salad, part entrée
- You agree to prorate their cost
- You need a set of weights
  - Cost of meal
  - Weight of food
  - Half and Half



## Allocation Options

- None
- Additional Cost
- Alternative Justifiable Expenditure Method
- Use of Facilities Method
- Percent of Benefits
- Separable Cost-Remaining Benefits (SCRB)



## SCRB Method

- Adopted by interagency agreement March 1954 as preferred method
- ER 1105-2-100 reaffirmed its preferred status





## Interim Review of Points

- A meal (a plan)
- Separation of meal into purpose foods (project purposes)
- Assign costs to food from each identifiable purpose (separable costs)
- Identify meal features that serve more than one purpose (joint-use facilities)

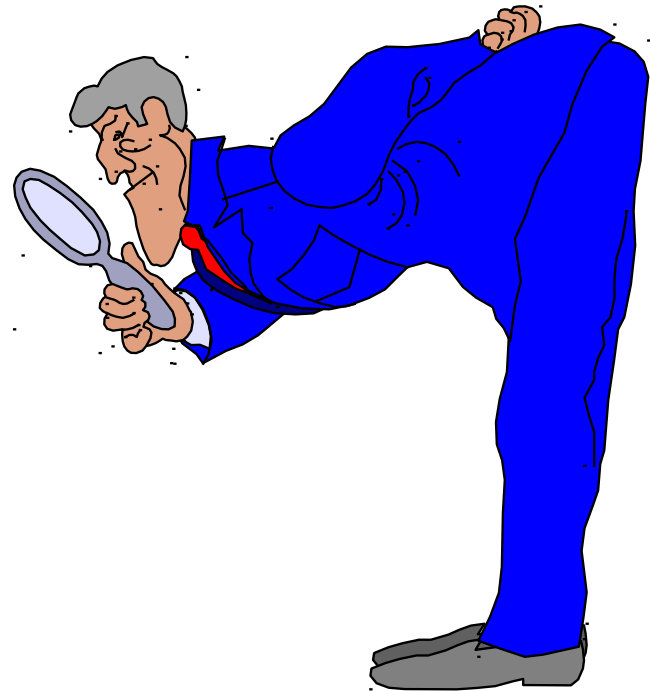


## Review Points Again and Again

- Determine a method to allocate joint use facilities to the other food categories
- Establish subsidy on each type of food (cost sharing percentages)
- Calculate your share and your employer's share of the meal costs (cost apportionment)
- For water resource problems the SCRB method is used to allocate joint costs.

## Where We are Going - The Second Objective

- Given a worksheet in class, correctly perform an example of the Separable Cost – Remaining Benefit Cost Allocation Method without physical injury.





## Review of Definitions

- **Cost Allocation** is the process of equitably distributing project costs among project purposes.
- **Separable costs** - costs incurred specifically to add a purpose to a project
- **Joint costs** - the difference between the total project costs and the sum of all separable costs



## **Formulation Requirements for SCRB Allocation**

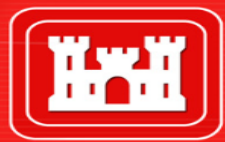
Cost allocation requires formulation of specific plans:

- Multipurpose plan
- Multipurpose plans less each purpose
- Most likely alternative single purpose plan

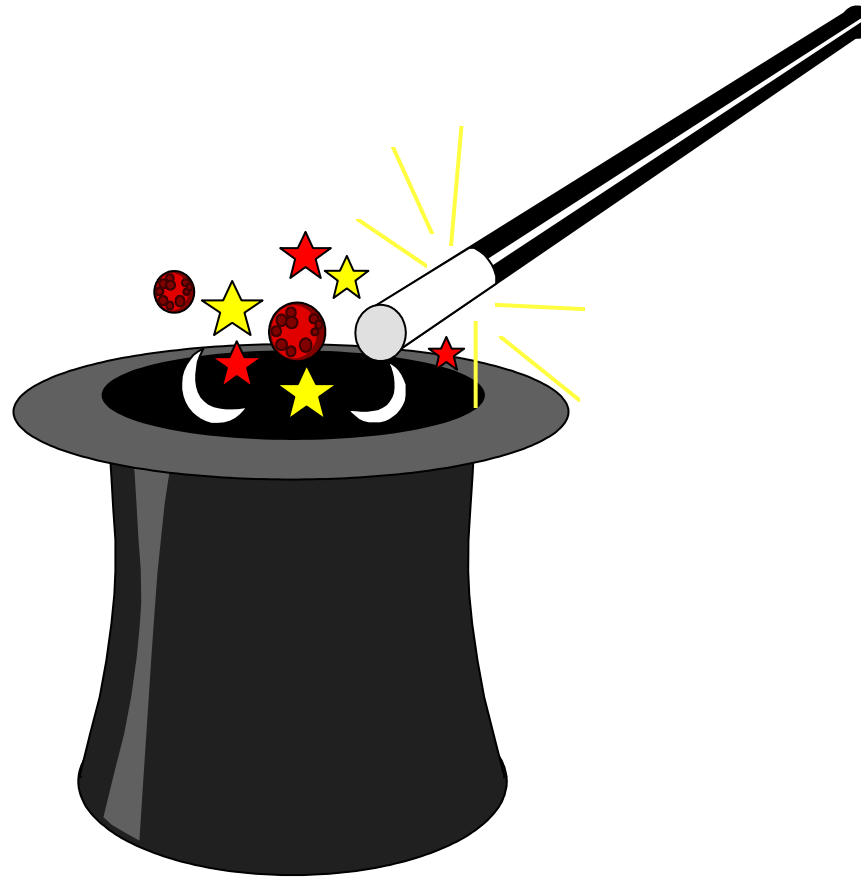


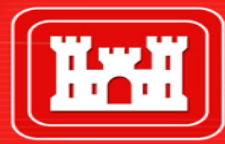
## Allocation Equity

- Use of the SCRB method results in the following maximum and minimum cost limits for each purpose
- Maximum:
  - Benefits to each purpose
  - Cost of the least cost alternative for each purpose.
- Minimum: separable costs
- Most likely: proportional sharing of joint costs of multipurpose added to minimum



## SCRB Example

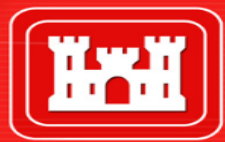




## SCRB Example

	Navigation	Ecosystem Restoration	Total
Average Annual Benefits			
Single Purpose Alternative Cost			
Limited Benefits/Costs			
Separable Costs			
Remaining Benefits			
Percent of Total			
Joint Costs			
Allocated joint cost			
Total allocation			





## The Project - Navigation and Ecosystem Restoration

- Total Cost = \$10M
- Cost without Ecosystem Restoration = \$8M
- Cost without Navigation = \$3M
- Navigation Benefits = \$12M
- Ecosystem Benefits = 185 H.U.



## SCRB Example

	Navigation	Ecosystem Restoration	Total
Average Annual Benefits	\$12.0	185HU	\$12.0 + 185HU
Single Purpose Alternative Cost	\$8.0	\$3.0	
Limited Benefits/Costs			
Separable Costs			
Remaining Benefits			
Percent of Total			
Joint Costs			
Allocated joint cost			
Total allocation			\$10



## SCRB Example

	Navigation	Ecosystem Restoration	Total
Average Annual Benefits	\$12.0	185HU	\$12.0 + 185HU
Single Purpose Alternative Cost	\$8.0	\$3.0	\$11.0
Limited Benefits/Costs	\$8.0	\$3.0	\$11.0
Separable Costs			
Remaining Benefits			
Percent of Total			
Joint Costs			
Allocated joint cost			
Total allocation			\$10



## SCRB Example

	Navigation	Ecosystem Restoration	Total
Average Annual Benefits	\$12.0	185HU	\$12.0 + 185HU
Single Purpose Alternative Cost	\$8.0	\$3.0	\$11.0
Limited Benefits/Costs	\$8.0	\$3.0	\$11.0
Separable Costs	\$7.0	\$2.0	\$9.0
Remaining Benefits			
Percent of Total			
Joint Costs			
Allocated joint cost			
Total allocation			\$10



## SCRB Example

	Navigation	Ecosystem Restoration	Total
Average Annual Benefits	\$12.0	185HU	\$12.0 + 185HU
Single Purpose Alternative Cost	\$8.0	\$3.0	\$11.0
Limited Benefits/Costs	\$8.0	\$3.0	\$11.0
Separable Costs	\$7.0	\$2.0	\$9.0
Remaining Benefits	\$1.0	\$1.0	\$2.0
Percent of Total			
Joint Costs			
Allocated joint cost			
Total allocation			\$10



## SCRB Example

	<b>Navigation</b>	<b>Ecosystem Restoration</b>	<b>Total</b>
Average Annual Benefits	\$12.0	185HU	\$12.0 + 185HU
Single Purpose Alternative Cost	\$8.0	\$3.0	\$11.0
Limited Benefits/Costs	\$8.0	\$3.0	\$11.0
Separable Costs	\$7.0	\$2.0	\$9.0
Remaining Benefits	\$1.0	\$1.0	\$2.0
Percent of Total	50%	50%	100%
Joint Costs			
Allocated joint cost			
Total allocation			\$10



## SCRB Example

	<b>Navigation</b>	<b>Ecosystem Restoration</b>	<b>Total</b>
Average Annual Benefits	\$12.0	185HU	\$12.0 + 185HU
Single Purpose Alternative Cost	\$8.0	\$3.0	\$11.0
Limited Benefits/Costs	\$8.0	\$3.0	\$11.0
Separable Costs	\$7.0	\$2.0	\$9.0
Remaining Benefits	\$1.0	\$1.0	\$2.0
Percent of Total	50%	50%	100%
Joint Costs	-	-	\$1.0
Allocated joint cost			
Total allocation			\$10



## SCRB Example

	Navigation	Ecosystem Restoration	Total
Average Annual Benefits	\$12.0	185HU	\$12.0 + 185HU
Single Purpose Alternative Cost	\$8.0	\$3.0	\$11.0
Limited Benefits/Costs	\$8.0	\$3.0	\$11.0
Separable Costs	\$7.0	\$2.0	\$9.0
Remaining Benefits	\$1.0	\$1.0	\$2.0
Percent of Total	50%	50%	100%
Joint Costs	-	-	\$1.0
Allocated joint cost	\$0.50	\$0.50	\$1.0
Total allocation			\$10





## SCRB Example

	<b>Navigation</b>	<b>Ecosystem Restoration</b>	<b>Total</b>
Average Annual Benefits	\$12.0	185HU	\$12.0 + 185HU
Single Purpose Alternative Cost	\$8.0	\$3.0	\$11.0
Limited Benefits/Costs	\$8.0	\$3.0	\$11.0
Separable Costs	\$7.0	\$2.0	\$9.0
Remaining Benefits	\$1.0	\$1.0	\$2.0
Percent of Total	50%	50%	100%
Joint Costs	-	-	\$1.0
Allocated joint cost	\$0.50	\$0.50	\$1.0
Total allocation	\$7.50	\$2.50	\$10



## Cost Sharing

	<b>Navigation</b>	<b>Ecosystem Restoration</b>	<b>Total</b>
Allocated	7.5M	2.5M	10M
Federal	6.75M	1.63M	8.38M
Non-Federal	0.75M	0.87M	1.62M
Total	7.50M	2.50M	10M

## Major Key Points



- You know all there is to know
- The allocation method is relatively straight forward – Those who benefit pay
- Problems relate to the inputs that are required

## Ecosystem Restoration Example

- To determine alternative project cost for ecosystem restoration purposes:

Determine the cost of the next most efficient plan producing the same ecosystem output and meeting the planning objectives
- If the plan formulation is done correctly, the cost of the ecosystem restoration portion of the multipurpose plan represents a more efficient investment. If not, reformulate.



# The Project - Flood Damage Reduction and Ecosystem Restoration

- Total Cost Dual-purpose Project = \$7,000
- Cost without Ecosystem Restoration = \$2,930
- Cost without Flood Damage Reduction = \$5,350
- Flood Damage Reduction Benefits = \$1,930
- Ecosystem Benefits = Non-monetary



## Flood Damage Reduction - Ecosystem Restoration SCRB

	Flood Damage Reduction	Ecosystem Restoratio n	Total
Average Annual Benefits	1,930	<b>Non-monetary</b>	1,930 + <b>Non-monetary</b>
Single Purpose Alternative Cost	2,930	5,350	8,280
Limited Benefits/Costs	1,930	5,350	7,280
Separable Costs	1,650	5,070	6,720
Remaining Benefits	280	280	560
Percent of Total	50%	50%	100%
Joint Costs	-	-	280
Allocated joint cost	140	140	-
Total allocation	1,790	5,210	7,000



## Another SCRB Example

	<b>Flood Damage Reduction</b>	<b>Water Supply</b>	<b>Recreation</b>	<b>Total</b>
Average Annual Benefits				
Single Purpose Alternative Cost				
Limited Benefits/Costs				
Separable Costs				
Remaining Benefits				
Percent of Total				
Joint Costs	-	-	-	
Allocated joint cost				
Total allocation				

# **What Information Do You Need?**



# What Information Do You Need?

- Multipurpose Project Costs
  - Total Multi-purpose Project Cost = \$15M
  - FDR and Water Supply Project Cost = \$13M
  - FDR and Recreation Project Cost = \$13M
  - Water Supply and Recreation Project Cost = \$12M
- Single Purpose Project Costs
  - Single Purpose Recreation Project Cost = \$ 10M
  - Single Purpose Water Supply Project Cost = \$ 8M
  - Single Purpose FDR Project Cost = \$12M
- Benefits
  - Recreation Benefits = \$5M
  - Water Supply Benefits = \$8M
  - Flood Damage Reduction Benefits = \$6M



## Another SCRB Example

	<b>Flood Damage Reduction</b>	<b>Water Supply</b>	<b>Recreation</b>	<b>Total</b>
Average Annual Benefits				
Single Purpose Alternative Cost				
Limited Benefits/Costs				
Separable Costs				
Remaining Benefits				
Percent of Total				
Joint Costs	-	-	-	
Allocated joint cost				
Total allocation				



**What did you get from this exercise?**



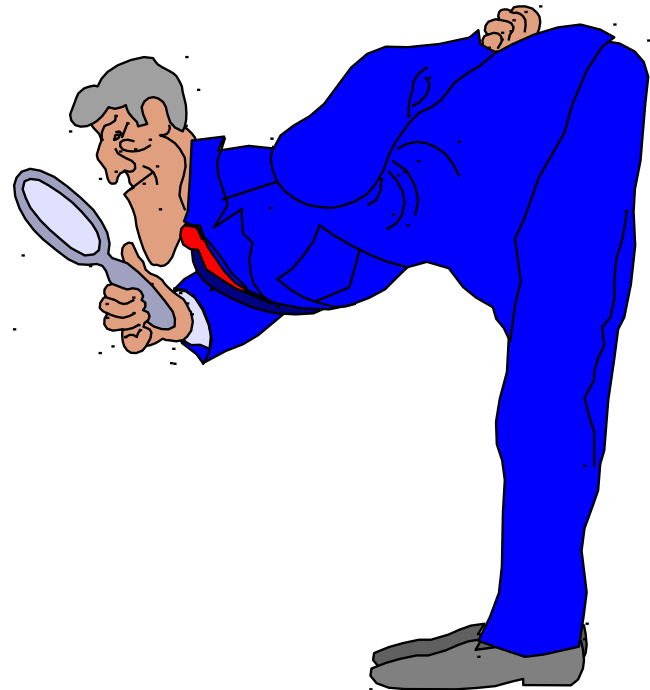
## Take Away Points

- Cost allocation applies to purposes
- Cost apportionment applies to cost sharing
- The SCRB method is the accepted method of allocating joint costs
- The SCRB method requires the formulation of many plans
- You can now impress your friends and co-workers

## Where We are Going

Next, we'll cover:

- Techniques for comparing plans with different outputs
- The concept of a “trade-off” situation
- Understand the basis for designating the NED/NER plan
- Understand the consequences of deviating from the NED/NER Plan and selecting the locally preferred plan (LPP)The



# GEN Patton on War

*(if he were around today)*

**“No bastard ever won a war  
by making PowerPoint slides  
for his country.”**

**“He won it by making  
the other poor dumb bastard  
make slides for his country.”**



George C. Scott as George S. Patton Jr.